B1 Contd

series resistance is remarkably increased and accordingly, current application to the laser is accompanied by Joule heat, thereby significantly deteriorating the optical output characteristic. For example, when the resonator has length of 100 micrometers, the series resistance reaches 20 ohms, which is four times greater than the laser resonator of 400 micrometers that is normally used. From this view point, as has been described above, the performance improvement of the semiconductor laser by reducing the resonator length can actually be realized only to 200 micrometers. On the other hand, it is known that in a distribution reflection type laser, by reducing the active area length, it is possible to obtain a stable longitudinal mode and increase the wave length changeable width. This is because a mode jump interval $\Delta\lambda$ of the distribution reflection type laser and an active area length La are in the relationship as follows: $\Delta\lambda = \lambda 2/2nLa$, wherein n represents a refractive index of the laser medium and λ represents an oscillation wavelength. In this case also, when the resonator and the active area are reduced so as to increase the $\Delta\lambda$, the laser gain is lowered, and the electric resistance and thermal resistance are increased. Accordingly, although the aforementioned effect is reported, it still cannot be used actually in practice. It should be noted that this type of semiconductor laser is described in the 17th Semiconductor Laser International Conference, technical digest paper ThA5.